

O. L. INGRAM.
TYPE WRITING MACHINE.
APPLICATION FILED JAN. 6, 1908.

940,322.

Patented Nov. 16, 1909.

3 SHEETS—SHEET 1.

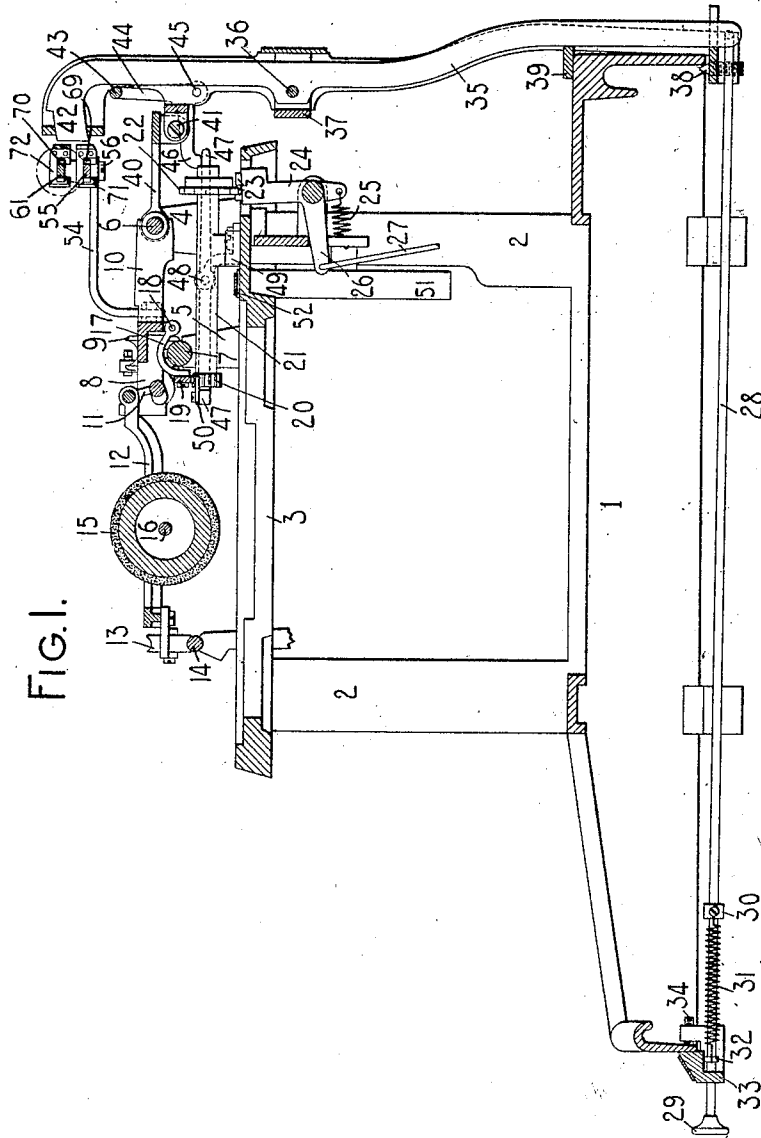


FIG. 1.

WITNESSES:

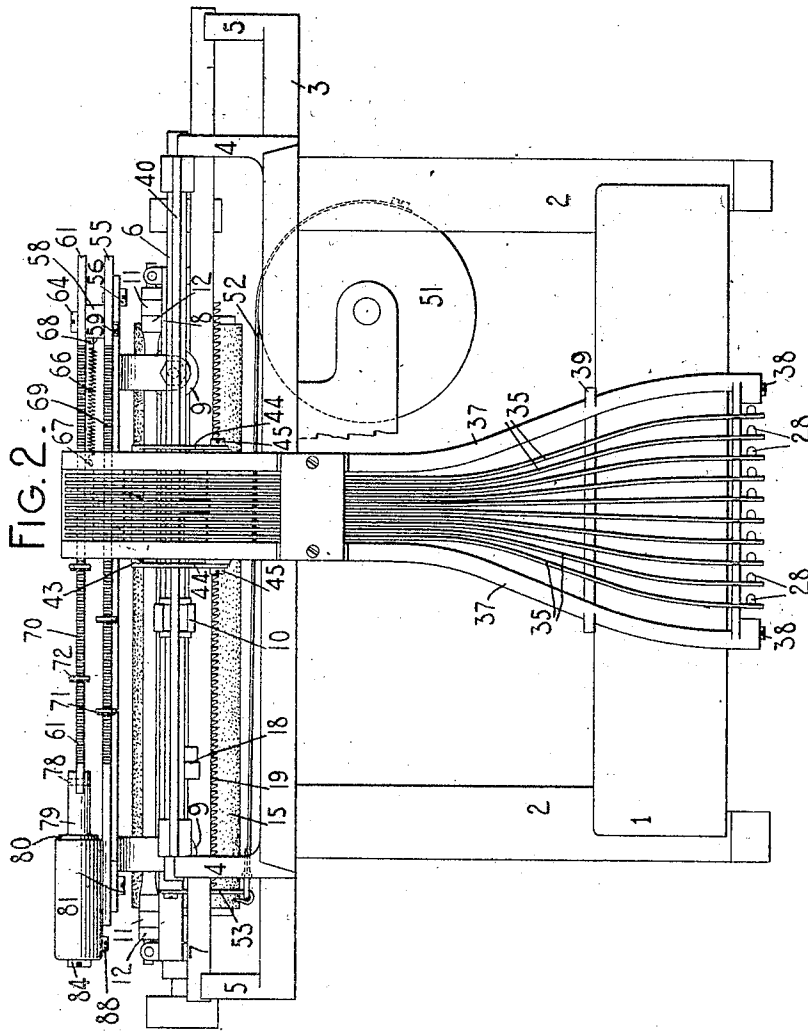
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

FIG. 3.

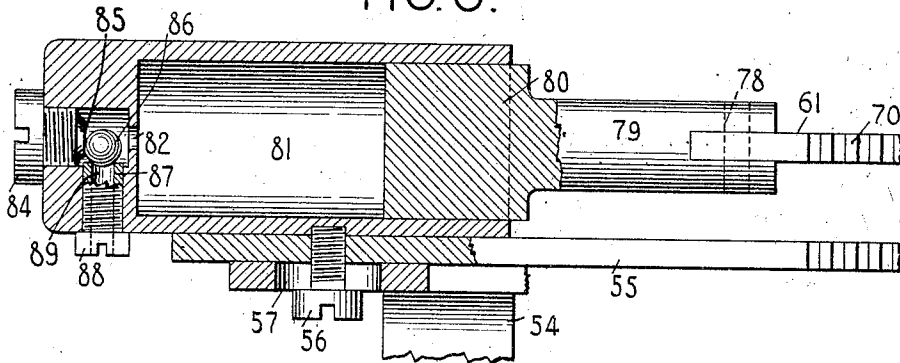


FIG. 4.

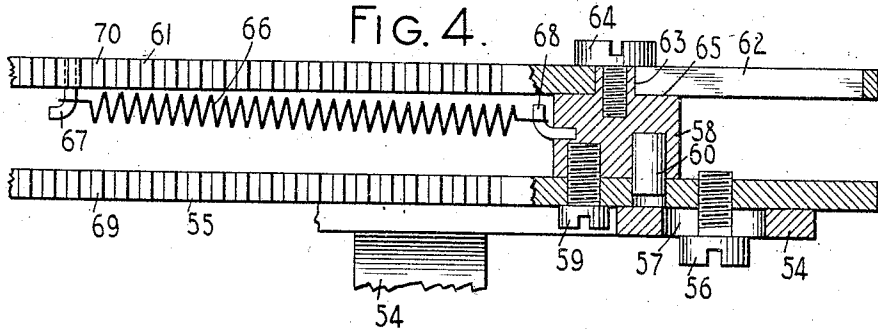


FIG. 5.

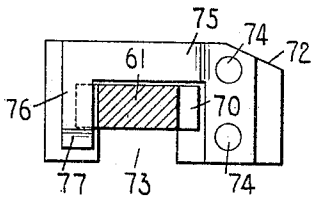


FIG. 6.

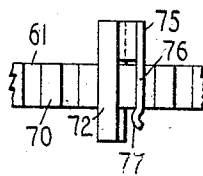
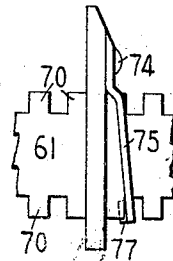


FIG. 7.



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TYPE-WRITING MACHINE.

940,322.

Specification of Letters Patent.

Patented Nov. 16, 1909.

Application filed January 6, 1908. Serial No. 409,500.

To all whom it may concern:

Be it known that I, OSCAR L. INGRAM, a citizen of the United States, and resident of Walla Walla, in the county of Walla Walla and State of Washington, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and more particularly to tabulating mechanism and to means for overcoming the shock ordinarily incident in arresting the carriage by the tabulating mechanism.

One object of my invention is to provide simple and efficient means of the character specified.

A further, and one of the main objects, of the invention is to provide efficient means for avoiding or overcoming the shock usually incident to arresting the carriage by the tabulating mechanism without decreasing the speed of the carriage from about the time of its release, as when a brake or governor is applied to retard the carriage in its movement to the point of arrest.

A still further object of my invention is to provide means of the character specified which are in the nature of attachments that may be readily applied to existing forms of typewriting machines.

To the above and other ends which will hereinafter appear, my invention consists in the features of construction, combinations of devices and arrangements of parts to be hereinafter specified and particularly pointed out in the appended claims.

In the accompanying drawings wherein like reference characters indicate corresponding parts in the various views, Figure 1 is a vertical front to rear central sectional view of a typewriting machine embodying my invention, parts of the machine being omitted. Fig. 2 is a rear elevation of the machine, parts being omitted. Fig. 3 is an enlarged detail fragmentary longitudinal sectional view taken centrally through the dash-pot. Fig. 4 is an enlarged detail fragmentary rear elevation, partly in section, showing the supports or racks for the column and buffer stops. Fig. 5 is an enlarged detail transverse sectional view of

a column stop bar with a column stop mounted thereon. Fig. 6 is an enlarged detail rear elevation of the same. Fig. 7 is an enlarged detail fragmentary plan view of the parts shown in Figs. 5 and 6.

I have shown my invention embodied in a No. 6 Remington machine equipped with a Gorin tabulator, the invention being readily applicable to such a machine and tabulator without material modification of the structural features thereof.

The frame of the machine comprises a base 1, corner posts 2 and a top plate 3. Upwardly extending lugs or risers 4 and 5 support guide rods 6 and 7. A carriage truck 8 carries supporting rollers 9 which cooperate with the guide rod 7 to support the truck for movement from side to side of the machine. A rearwardly extending arm 10 projects from the truck and cooperates at its rear end with the guide rod 6 to support and steady the truck in its movements. Links 11 connect a platen frame 12 to the truck, said platen frame having a roller 13 at the forward side thereof for cooperation with the shift rail 14 supported in the usual manner for back and forth movements to change the case position of the platen 15 supported on a shaft 16 received in bearing openings in the platen frame. The truck has arms 17 pivoted thereto at 18 and connected at their forward ends to a feed rack 19 which cooperates with a feed pinion 20 mounted on the forward end of a shaft that turns in a bearing 21 secured to the top plate of the machine, the rear end of the shaft being operatively connected to an escapement wheel 22. Feed dogs 23 are mounted on a dog rocker 24 and cooperate with the escapement wheel, the dog rocker being returned to normal position by a spring 25. A forwardly projecting arm 26 on the dog rocker is connected to a link 27 connected in the usual manner to a universal bar actuated by key levers (not shown).

A series of push rods 28 extend beneath the base of the machine and are provided at their forward ends with tabulator keys 29, each rod carrying a sleeve or collar 30 which is connected to one end of a spring 31 connected at its opposite end to a pin 32 which

projects from a frame piece 33 secured to the base of the machine by screws 34. The rear end of each push rod is connected to an upright tabulator lever 35, the levers being pivoted at 36 to a tabulator frame 37 secured by screws 38 and a supporting piece 39 at the lower end portion thereof to the base of the machine and secured at the upper end portion thereof to the guide rod 6 by a yoke piece 40 connected by screws 41 to the tabulator frame. The upper ends of the levers 35 are bent forwardly to provide denominational tabulator stops 42 which are projected through guide openings in the tabulator frame. A universal bar 43 extends across and in front of the upper end portions of the upright levers 35 for actuation by any of said levers when the denominational stop thereon is projected forwardly. The universal bar is provided at its ends with supporting arms 44 pivoted at 45 to the sides of the tabulator frame. One of these supporting arms is extended forwardly to provide a release arm 46 which extends above and coöperates with the rear end of a release lever 47 pivoted at 48 intermediate its ends to a bracket 49 supported on the top plate of the machine. The forward end of the release lever 47 is provided with a lifting shoe 50 apertured to receive the feed pinion 20. This shoe 50 projects beneath the feed rack 19 and is free from contact therewith in the normal positions of the parts. When a tabulator key 29 is moved rearwardly against the tension of the spring 31, the associated lever 35 will be turned on its pivot 36 to project the denominational stop 42 at the upper end thereof forwardly. The effect of this movement is to actuate the universal bar 43, thereby depressing the arm 40 and lifting the forward end of the release lever 47 to disengage the feed rack 19 from its feed pinion, thus releasing the carriage and enabling it to travel in the direction of its feed under the power of a spring drum 51 connected by a band 52 to a depending arm 53 connected to the carrier. Projecting upwardly and rearwardly from the carriage truck are bracket arms 54 which ordinarily support the column stop bar, the stops on which are coöperative with the denominational stops. The construction thus far described is essentially that of a No. 6 Remington machine equipped with the Gorin tabulator and further detailed description is deemed unnecessary.

The usual column stop bar ordinarily employed in the Gorin tabulator may be detached from the brackets 54 and replaced by the supports shown in the drawings and which comprise a support or rack 55 which corresponds essentially to the column stop bar ordinarily employed in the Gorin tabulator. This stop bar is adjustably connected

to its supporting brackets 54 by headed screws 56, each of which passes freely through a slot 57 in the associated bracket 54 to afford a slight longitudinal adjustment of the rack 55 on its supporting brackets, the rack being held in its adjusted position when the screws are tightened by the friction between the brackets and the rack and screw heads. Arranged above the rack 55 near the ends thereof are supporting or spacing blocks 58, each of which is tapped to receive the stem of a screw 59 which passes through an opening in the rack 55 to secure the spacing block to said rack (Fig. 4). A dowel or positioning pin 60 may likewise be employed between the rack 55 and each spacing block 58. Arranged above the rack 55 and parallel therewith is a second supporting bar or rack 61 slotted at its ends as at 62 to receive upwardly extending projections 63 on the spacing blocks 58. A headed screw 64 is received in a tapped opening in each of the projections 63 to prevent the removal of the rack 61 from the spacing blocks. The lower face of the rack 61 receives a bearing on the upper faces 65 of the spacing or supporting blocks 58 and the construction is such that a relative longitudinal movement may be effected between the racks 55 and 61 in the direction of the travel of the carriage. A contractile spring 66 is connected at one end to a pin 67 which projects from the rack 61, the other end of said spring being connected to a pin or projection 68 on the left-hand spacing block 58. The pressure of the spring is exerted to normally maintain a fixed relation between the racks or supports 55 and 61, the spring normally holding the movable rack or support in such position that the right-hand end wall of each slot 62 bears against the projection 63 of the associated spacing block. The racks 55 and 61 are each provided on opposite sides thereof with square teeth 69 and 70 respectively for coöperation with detachable stops 71 and 72. Both sets of stops are the same in construction and the description of one will apply alike to the other and but one will be described. Thus from an inspection of Figs. 5, 6 and 7 it will be seen that the stops 72 are each bifurcated at 73 to straddle the stop bar rack or support 61 and to engage at the side walls of the bifurcation in the spaces between the teeth 70 on the rack. Each stop has riveted thereto at 74 a leaf spring 75 which at its free end portion extends away from the body of the slot as shown in Fig. 7, and is formed with a downward projection as indicated at 76 in Figs. 5 and 6. This projection is formed with an enlargement or bent end 77 which, when the projection 76 is received in an opening between the teeth 70, is adapted to engage beneath the corner of one of the teeth as

shown in Figs. 6 and 7 to prevent an accidental detachment of the stop from the rack. The column stops 71 and stops 72, which latter will be hereinafter referred to as buffer stops, are arranged one set above the other in close proximity as shown in Fig. 1 so that both sets of stops may cooperate with each of the denominational stops 42 when it is projected forwardly.

10 From an inspection of Figs. 2 and 3 it will be seen that the right-hand end of the rack 61 is connected at 78 to the stem 79 of a piston 80 which works in a cylinder 81, there being sufficient space between the edge of the piston and the inner wall of the cylinder to allow a slight leakage of air past the piston. The cylinder 81 is fixed to the column stop bar 65 by the right-hand screw 56 which secures the stop bar 55 to the associated 20 bracket arm, the end of the screw 56 being received in a tapped opening in the cylinder.

The cylinder head is perforated at 82 to provide communication between the interior of the cylinder and valve chamber 83 formed in the head of the cylinder. The valve chamber is closed at one end by a screw 84 provided at its inner end with a reduced projection 85, against which a ball valve 86 is adapted to bear in the normal disposition 25 of the parts. The ball valve 86 normally rests upon a valve seat 87 formed at the upper end of a hollow screw 88 threaded into a laterally extending opening in the cylinder head to form a passage 89 between 30 the interior of the cylinder and the outer air, said passage being normally closed by the valve or ball 86. It will be seen that in the normal position of the parts the ball valve 86 bears against the projection 85 on the screw 84 so that it cannot be displaced from the valve seat by air pressure passing through the opening 82 in the cylinder head. The construction is such that a movement of the piston toward the cylinder head tends to 35 force the ball valve with a greater pressure against its valve seat to prevent the escape of air from the interior of the cylinder through the passage 89, although at this time there will be a slight leakage of air around the edge of the piston. When the 40 piston moves in an opposite direction in the cylinder the suction produced therein will automatically displace the ball valve 86 from its seat, thus providing a free communication from the interior of the cylinder to the outer air through the passage 89 to enable the piston to be quickly returned to its normal or outermost position in the 45 cylinder.

50 The construction thus described constitutes a cushion, or more specifically considered, an air-cushion or dash-pot which is adapted to receive the impact of the carriage as will hereinafter more clearly appear.

From certain aspects of my invention it is immaterial what character of cushion is employed, the word "cushion" being used in a broad sense although I prefer in practice to employ an air-cushion or dash-pot as shown.

In the use of the devices a number of 70 buffer stops 72 are preferably employed which correspond to the number of column stops used. Thus in the present instance two column stops are shown in Fig. 2 and two buffer stops 72 are likewise employed, 75 each buffer stop being situated to the left of the column stop with which it is intended to be employed. Of course, the adjustment of the column stop will depend upon the position of the columnar field to 80 be written and the buffer stops 72 are adjusted according to the adjustment of the column stops, and the distance that each buffer stop is normally situated from the associated column stop determines the 85 amount of absorption of the energy of the carriage before it is arrested by the column stop, as will hereinafter more clearly appear. When the stops 71 and 72 have been adjusted in the manner described and the tab- 90 ulator key 29 is pushed rearwardly, the associated denominational stop 42 will be projected forwardly into the paths of both of the sets of stops 71 and 72. Since each 95 of the stops 72 is situated to the left of its associated column stop 71 it will, however, be brought into contact with the projected denominational stop before the column stop can cooperate therewith. When an engage- 100 ment between a stop 72 and the projected denominational stop takes place the stop 72 and the bar 61 on which it is supported is arrested while the carriage continues its movement. The relative movement thus 105 effected between the carriage and stop bar 61 is effective to bring about a movement of the piston head 80 in the cylinder of the dash-pot, thus cushioning and absorbing the impact of the carriage. The relative movement between the racks 61 and 55 continues 110 until the column stop just to the right of the engaged buffer stop is brought into contact with the projected denominational stop and the carriage is brought to rest by an easy movement without shock or jar and without 115 liability of injury to the parts. As the denominational stop is withdrawn after the arrest of the carriage has been effected in the manner described, the feed rack reengages the feed pinion to hold the carriage 120 against further free movement and as the buffer stop 72 is disengaged the spring 66 will quickly move the rack 61 back to its normal position, the dash-pot, by reason of the automatic action of the valve 86, at this 125 time offering no obstruction to the relative movement of the racks 55 and 61.

From the foregoing description it will be

understood that the greater the distance of a buffer stop 72 from its associated column stop, the greater will be the extent of relative movement between the racks 61 and 55 and that the cushioning effect may in this manner be varied accordingly. Thus, if the column stops are situated so that a long run of the carriage is effected when such column stop is brought into use, the associated buffer stop may be situated at a greater distance from the column stop than would be required when a column stop is situated in a position to afford only a comparatively short run of the carriage. The effect of the buffer or cushion may thus be nicely regulated for each of the column stops without affecting the cushion or dash-pot itself except that the piston will receive a longer or shorter travel in the cylinder according to the relative adjustment between the different stops 72 and their associated column stops 71 and according to the force of the impact of the carriage and the extent of travel thereof before it is arrested by the cooperation of a buffer stop with the projected denominational stop.

From the foregoing description it will be understood that the buffer stops may each be said to constitute an impact device for cooperation with a denominational or tabulator stop 42 and that each of the impact devices or stops 72 is supported by a cushion; that a cushion or dash-pot tends to resist a relative movement or displacement between the racks or supports 55 and 61 from the normal position; but does not resist the relative movement between said parts back to normal position so that the parts may be quickly restored to their normal relations.

While I have referred herein to a carriage it should be understood that this term is employed in a broad sense and is intended not only to cover a platen carrying carriage of the style shown, but also to cover all styles of carriages whether of the general character shown or those ordinarily employed in flat platen machines.

From a broad aspect each of the stops 42 constitutes a tabulator stop. From a more specific aspect each of said stops is a denominational stop. Each of the stops 71 is a tabulator stop considered from a broad aspect. From a more specific point of view each of said stops is a column stop and in the accompanying claims these distinctions have been recognized.

While I have shown and described in specific detail one form of construction embodying my invention, it should be understood that various changes may be made without departing from the invention.

What I claim as new and desire to secure by Letters Patent, is:—

1. In a typewriting machine and tabulat-

ing mechanism, the combination of a carriage, tabulator stops for arresting the carriage, and impact means which are brought into operation before the tabulator stops co-act, said impact means including a cushion supported device.

2. In a typewriting machine and tabulating mechanism, the combination of a carriage, tabulator stops for arresting the carriage, an air cushion, and impact means cooperating therewith to absorb the shock of the carriage before said stops are brought into cooperative relation.

3. In a typewriting machine and tabulating mechanism, the combination of a carriage, tabulator stops for arresting the carriage, an air cushion, impact means cooperating therewith to absorb the shock of the carriage before said stops are brought into cooperative relation, and means for regulating the effect of said air cushion.

4. In a typewriting machine and tabulating mechanism, the combination of a carriage, tabulator stops for arresting the carriage, impact means which are brought into operation before the tabulator stops co-act, said impact means including a cushion supported device, and means for regulating the effect of said impact means.

5. In a typewriting machine and tabulating mechanism, the combination of a carriage, tabulator stops for arresting the carriage, a dash-pot, and impact means cooperative with said dash-pot, said impact means being thrown into operation before said stops are brought into engagement.

6. In a typewriting machine and tabulating mechanism, the combination of a carriage, tabulator stops for arresting the carriage, a dash-pot, and impact means cooperative with said dash-pot, said impact means being thrown into operation before said stops are brought into engagement, said impact means including adjustable means to regulate the effect of the dash-pot.

7. In a typewriting machine and tabulating mechanism, the combination of a carriage, tabulator stops for arresting the carriage, and buffer mechanism that absorbs the shock of the carriage before said stops are brought into cooperative relation, said buffer mechanism including an impact device that is adjustable to normally bear a predetermined relation to one of said tabulator stops.

8. In a typewriting machine and tabulating mechanism, the combination of a carriage, tabulator stops for arresting the carriage, and impact means which are brought into operation before the tabulator stops co-act, said impact means including a cushion supported device adjustable to different set positions to normally bear a predetermined relation to one of said tabulator stops.

9. In a typewriting machine and tabulat-

ing mechanism, the combination of a carriage, tabulator stops for arresting the carriage, an air cushion, and impact means co-operating therewith to absorb the shock of the carriage before said stops are brought into coöperative relation, said impact means including an impact device that is adjustable to different set positions to normally bear a predetermined relation to one of said tabulator stops.

10. In a typewriting machine and tabulating mechanism, the combination of a carriage, tabulator stops for arresting the carriage, a dash-pot for receiving the impact of the carriage, and a valve, the valve being closed during the movement of the piston of the dash-pot in one direction in its cylinder and being automatically opened when the piston moves in the opposite direction.

11. In a typewriting machine and tabulating mechanism, the combination of a carriage, tabulator stops for arresting the carriage, a dash-pot for receiving the impact of the carriage, and a ball valve closed during the movement of the piston of the dash-pot in one direction in its cylinder and automatically opened during the movement of the piston in the opposite direction.

12. In a typewriting machine and tabulating mechanism, the combination of a carriage, tabulator stops for arresting the carriage, a dash-pot, and means actuated independently of the impact between said stops for operating said dash-pot to receive the impact of the carriage before said stops are brought into engagement with each other.

13. In a typewriting machine and tabulating mechanism, the combination of a carriage, tabulator stops for arresting the carriage, a dash-pot, and means actuated independently of the impact between said stops for operating said dash-pot to receive the impact of the carriage before said stops are brought into engagement with each other, said means including a device adjustable relatively to one of said tabulator stops to determine at what period relatively to the arrest of the carriage by the tabulator stops the dash-pot will be rendered operative.

14. In a typewriting machine and tabulating mechanism, the combination of a carriage, two co-acting tabulator stops, a third stop independent of the tabulator stops and acted upon by one of said tabulator stops in advance of the impact between the tabulator stops, and a cushion coöperative with said third stop.

15. In a typewriting machine and tabulating mechanism, the combination of a carriage, two co-acting tabulator stops, a third stop independent of the tabulator stops and acted upon by one of said tabulator stops in advance of the impact between the tabulator stops and arrested independently of the car-

riage when said third stop is acted upon by said tabulator stop as specified, and a cushion coöperative with said third stop.

16. In a typewriting machine and tabulating mechanism, the combination of a carriage, two co-acting tabulator stops, a third stop independent of the tabulator stops and acted upon by one of said tabulator stops in advance of the impact between the tabulator stops and arrested independently of the carriage when said third stop is acted upon by said tabulator stop as specified, and a dash-pot coöperative with said third stop.

17. In a typewriting machine and tabulating mechanism, the combination of a carriage, two co-acting tabulator stops, a third stop independent of the tabulator stops and acted upon by one of said tabulator stops in advance of the impact between the tabulator stops and arrested independently of the carriage when said third stop is acted upon by said tabulator stop as specified, a dash-pot coöperative with said third stop, and an automatically operating valve for said dash-pot.

18. In a typewriting machine and tabulating mechanism, the combination of a carriage, two co-acting tabulator stops, a third stop independent of the tabulator stops and acted upon by one of said tabulator stops in advance of the impact between the tabulator stops and arrested independently of the carriage when said third stop is acted upon by said tabulator stop as specified, a cushion coöperative with said third stop, and means by which an adjustment of said third stop may be effected.

19. In a typewriting machine and tabulating mechanism, the combination of a carriage, two co-acting tabulator stops, a third stop independent of the tabulator stops and acted upon by one of said tabulator stops in advance of the impact between the tabulator stops and arrested independently of the carriage when said third stop is acted upon by said tabulator stop as specified, a dash-pot coöperative with said third stop, and means for effecting an adjustment of said third stop.

20. In a typewriting machine and tabulating mechanism, the combination of a carriage, two co-acting tabulator stops, a third stop independent of the tabulator stops and acted upon by one of said tabulator stops in advance of the impact between the tabulator stops and arrested independently of the carriage when said third stop is acted upon by said tabulator stop as specified, a dash-pot coöperative with said third stop, an automatically operating valve for said dash-pot, and means by which an adjustment of said third stop may be effected.

21. In a typewriting machine and tabulating mechanism, the combination of a car-

riage, a support that is relatively fixed, a column stop carried by the relatively fixed support, a second support that moves independently of said relatively fixed support, a buffer operatively connected to said movable support, and a tabulating device that coöperates with said movable support and with said column stop.

22. In a typewriting machine and tabulating mechanism, the combination of a carriage, two supports, a column stop carried by one of said supports, a buffer stop carried by the other support, said supports being independently movable, and a tabulator stop that coöperates with the buffer and column stops.

23. In a typewriting machine and tabulating mechanism, the combination of a carriage, a column stop, buffer mechanism which is mounted and moves independently of the column stop, and a tabulator stop that coöperates with the buffer mechanism and with the column stop.

24. In a typewriting machine and tabulating mechanism, the combination of a carriage, two relatively movable supports, a column stop carried by one of said supports, a buffer stop carried by the other support, and a tabulator stop that coöperates first with the buffer stop and then with the column stop.

25. In a typewriting machine and tabulating mechanism, the combination of a carriage, two relatively movable supports, a cushion which tends to resist the relative movement of said supports, a column stop carried by one of said supports, a buffer stop carried by the other support, and a tabulator stop that coöperates first with the buffer stop and then with the column stop.

26. In a typewriting machine and tabulating mechanism, the combination of a carriage, two relatively movable supports, a dash-pot that tends to resist the relative movement of said supports, a column stop carried by one of said supports, a buffer stop carried by the other support, and a tabulator stop that coöperates first with the buffer stop and then with the column stop.

27. In a typewriting machine and tabulating mechanism, the combination of a carriage, two relatively movable supports, a column stop carried by and adjustable on one of said supports, a buffer stop carried by and adjustable on the other support, and a tabulator stop that coöperates first with the buffer stop and then with the column stop.

28. In a typewriting machine and tabulating mechanism, the combination of a carriage, two relatively movable supports, a cushion which tends to resist the relative movement of said supports, a column stop carried by and adjustable on one of said supports, a buffer stop carried by and adjustable on the other support, and a tabulator stop that coöperates first with the buffer stop and then with the column stop.

able on the other support, and a tabulator stop that coöperates first with the buffer stop and then with the column stop.

29. In a typewriting machine and tabulating mechanism, the combination of a carriage, two relatively movable supports, a dash-pot that tends to resist the relative movement of said supports, a column stop carried by and adjustable on one of said supports, a buffer stop carried by and adjustable on the other support, and a tabulator stop that coöperates first with the buffer stop and then with the column stop.

30. In a typewriting machine and tabulating mechanism, the combination of a carriage, two relatively movable supports, a dash-pot that tends to resist the relative movement of said supports, a column stop carried by one of said supports, a buffer stop carried by the other support, a tabulator stop that coöperates with the buffer stop and with the column stop, and an automatically acting valve for the dash-pot, said valve being closed during the relative movement between said supports in one direction and being open during the relative movement of said supports in the opposite direction.

31. In a typewriting machine and tabulating mechanism, the combination of a carriage, two racks mounted for relative movement, a column stop adjustable on one of said racks, a buffer stop adjustable on the other of said racks, a cushion tending to resist the relative movement of said racks, and a tabulator stop that coöperates with the buffer stop and with the column stop.

32. In a typewriting machine and tabulating mechanism, the combination of a carriage, two parallel bars mounted for relative movement in the direction of the travel of the carriage, a column stop adjustable on one of said bars, a buffer stop adjustable on the other of said bars, a cushion tending to resist the relative movement of said bars, and a tabulator stop that coöperates with the buffer stop and with the column stop.

33. In a typewriting machine and tabulating mechanism, the combination of a carriage, two parallel bars mounted for relative movement in the direction of the travel of the carriage, a spring which tends to maintain a fixed relation between the said bars, a column stop adjustable on one of said bars, a buffer stop adjustable on the other of said bars, a dash-pot which tends to resist the relative movement of said bars, and a tabulator stop that coöperates first with the buffer stop and then with the column stop.

34. In a typewriting machine and tabulating mechanism, the combination of a carriage, two parallel bars mounted for relative movement in the direction of the travel of the carriage, a spring which tends to maintain a fixed relation between the said bars, a

column stop adjustable on one of said bars, a buffer stop adjustable on the other of said bars, a dash-pot which tends to resist the relative movement of said bar, a tabulator stop that coöperates first with the buffer stop and then with the column stop, and an automatically acting valve for said dash-pot, said valve being closed during the relative movement of the bars from normal position and open during the relative movement of the bars back to normal position.

35. In a typewriting machine and tabulating mechanism, the combination of a carriage, two parallel racks carried by the carriage and mounted for relative movement thereon in the direction of the travel of the carriage, a column stop adjustable on one of said racks, a buffer stop adjustable on the other of said racks, a cushion which tends to resist a relative movement of the racks, and a tabulating stop coöperative with said buffer and column stops.

36. In a typewriting machine and tabulating mechanism, the combination of a carriage, two parallel racks carried by the carriage and mounted for relative movement thereon in the direction of the travel of the carriage, a column stop adjustable on one of said racks, a buffer stop adjustable on the other of said racks, a spring which tends to maintain a fixed relation between said racks, a dash-pot which tends normally to resist a relative movement of the racks, and a tabulating stop coöperative with said buffer and column stops.

37. In a typewriting machine and tabulating mechanism, the combination of a carriage, two parallel racks carried by the carriage and mounted for relative movement thereon in the direction of the travel of the carriage, a column stop adjustable on one of said racks, a buffer stop adjustable on the other of said racks, a spring which tends to maintain a fixed relation between said racks, a dash-pot, an automatically acting valve for said dash-pot, said valve being closed when the racks move relatively away from normal position and opening automatically when the racks move relatively back to normal position, and a tabulating stop coöperative with said buffers and column stops.

38. In a typewriting machine and tabulating mechanism, the combination of a carriage, two parallel racks mounted for relative movement in the direction of the travel of the carriage, a column stop adjustable on one of said racks, a buffer stop adjustable on the other of said racks, a cushion which tends to resist a relative movement of the racks from normal position, and a plurality of denominational stops each of which is coöperative with the buffer and column stops.

39. In a typewriting machine and tabulating mechanism, the combination of a car-

riage, two parallel racks carried by the carriage and mounted for relative movement thereon in the direction of the travel of the carriage, a column stop adjustable on one of said racks, a buffer stop adjustable on the other of said racks, a spring which tends to maintain a fixed relation between said racks, a dash-pot which tends to resist a relative movement of the racks from normal position, and a plurality of denominational stops each of which is coöperative with the buffer and column stops.

40. In a typewriting machine and tabulating mechanism, the combination of a carriage, two parallel racks carried by the carriage and mounted for relative movement thereon in the direction of the travel of the carriage, a column stop adjustable on one of said racks, a buffer stop adjustable on the other of said racks, a spring which tends to maintain a fixed relation between said racks, a dash-pot, an automatically acting valve for said dash-pot, said valve being closed when the racks move relatively away from the normal position and opening automatically when the racks move relatively back to normal position, and a tabulating stop coöperative with said buffer and column stops, and a plurality of denominational stops each of which is coöperative with the buffer and column stops.

41. In a typewriting machine and tabulating mechanism, the combination of a carriage, two relatively movable supports, a cushion which tends to resist the relative movement from normal position of said supports, a plurality of column stops carried by one of said supports, a plurality of buffer stops corresponding in number to the column stops and mounted on the other of said supports, and a tabulator stop coöperative with said buffer and column stops.

42. In a typewriting machine and tabulating mechanism, the combination of a carriage, two relatively movable supports, a cushion which tends to resist the relative movement from the normal position of said supports, a plurality of column stops carried by one of said supports, a plurality of buffer stops corresponding in number to the column stops and mounted on the other of said supports, and a plurality of denominational stops, each coöperative with the buffer and column stops.

43. In a typewriting machine and tabulating mechanism, the combination of a carriage, two relatively movable parallel supporting bars, a cushion which tends to resist the relative movement from the normal position of said supports, a plurality of independently adjustable column stops carried by one of said supporting bars, a plurality of buffer stops corresponding in number to the column stops and mounted on the other

of said supporting bars, and a tabulator stop coöperative alternately with said buffer and column stops.

44. In a typewriting machine and tabulating mechanism, the combination of a carriage, two relatively movable parallel supporting bars, a cushion which tends to resist the relative movement from the normal position of said supports, a plurality of independently adjustable column stops carried by one of said supporting bars, a plurality of buffer stops mounted on the other of said

supporting bars, and a plurality of denominational stops each coöperative alternately with the buffer and the column stops. 15

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 4th day of January A. D. 1908.

OSCAR L. INGRAM.

Witnesses:

E. M. WELLS,

M. F. HANNWEBER.